

(d) REMARKS

The claims are 17-21 with claim 17 the sole independent claim.

Claims 17-21 were deemed objectionable regarding antecedent basis for “an electrode on the substrate in the second chamber.” Without necessarily agreeing, claim 17 has been amended pursuant to original claim 11 and paragraphs [0022] and [00307]. Therefore, the objection, having been met, it should be withdrawn.

The Examiner had rejected claims 17, 18 and 20 as obvious over Garvey ‘336 in view of Inaba ‘403. Claims 19 and 21 were rejected as obvious over the same combination of references and further in view of Ishikura ‘033.

Garvey is said to teach a unit for forming an aerosol of generated carbon fibers and a pressure difference between the chambers. Garvey is said to be silent regarding (a) a transporting tube connecting first and second chambers to transport carbon fibers; (b) an end of the transporting tube faces the substrate in the second chamber and (c) a nozzle connected to the end of the transporting tube. Inaba is said to teach that which is missing from Garvey in Fig. 11.

A key feature of the present apparatus is to align the carbon fibers in a lengthwise direction in the direction of transportation to allow the ends of the fibers to impact the substrate to provide enhanced contact. The use of the claimed transporting tube and a pressure control means to provide reduced pressure in the second chamber is critical to properly conduct the aerosol of carbon fibers from the first to the second chambers in an oriented direction to impact the substrate.

Garvey admittedly lacks a transporting tube needed to align the carbon fibers in an aerosol and an end of the tube facing the substrate to deliver the oriented fibers

directly to the target substrate. In Garvey, fibers or powders are deposited, inter alia, over the walls of the second chamber, as well as the substrate, since the plasma generated is not well focused.

Inaba fails to teach that which is missing from Garvey. Specifically, Inaba fails to teach or suggest generating or transporting carbon fibers, nor of the problems in orienting carbon fibers to impact endwise on a substrate.

In Table 1, Inaba shows that particles from 1-5 microns in diameter are formed during his process. A specific filter is required to remove the particles. In column 13, lines 16-30 of Inaba a detailed description of the acute angled or roundish, particles formed is presented. No carbon fiber generation is disclosed or suggested. The portions of Inaba relied on by the Examiner merely teach removal of neutral particles by a filter.

As described in column 3, line 32 to column 4, line 35 of Inaba '403, positive carbon ions are generated by arc discharge and the generated positive carbon ions are deposited on the surface of a substrate to form a layer of carbon. An electrode for causing discharge generally includes a catalytic metal when carbon fibers are to be generated by arc discharge. However, Inaba fails to teach or suggest an electrode which includes such a catalytic metal. In other words, Inaba neither teaches nor suggests generating carbon fibers because Inaba teaches carbon particles are formed and also Inaba does not use a catalytic material necessary for generating carbon fibers. Therefore, Inaba, which neither teaches nor suggests generating and transporting carbon fibers, fails to teach or suggest the advantage of the present invention of aligning the directions of carbon fibers by transporting the carbon fibers in a transporting tube by a pressure difference.

Inaba generates positive carbon ions and transports them through a magnetic field by cyclotron motion, while Garvey generates carbon fibers and injects them from an orifice of a chamber. The Examiner states that the motivation to combine Inaba and Garvey is to provide a device for generating carbon fibers and transporting them from a chamber to the next chamber under a reduced pressure. However, there is no motivation to combine the references because Inaba does not disclose generating carbon fibers as mentioned above. Therefore, there is no reason to modify the structure of Garvey based on Inaba.

Furthermore, one would not incorporate the electric field filter or neutral filters which remove carbon particles and are a key feature of Inaba, in Garvey since Garvey generates carbon nano tubes. If one were to use Garvey to make a nanopowder, instead of nanotubes, then Garvey would not be applicable to the present apparatus, since no carbon fiber orientation issues would arise.

Ishikura teaches forming metallic particles, not carbon fibers, in a gas. Ishikura does not disclose or suggest an aerosol stream of carbon fibers which forcefully contact and form a vertically oriented structure on a substrate.

Accordingly, Applicants submit that none of the references, whether considered alone or in combination, discloses or suggests the present claimed invention nor renders it unpatentable. Accordingly, it is respectfully requested that the claims be allowed and that the case be passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Peter Saxon", written over a horizontal line.

Peter Saxon
Attorney for Applicants
Registration No. 24,947

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

NY_601475v1